TRANSACTIONS

OF THE

AMERICAN SOCIETY OF CIVIL ENGINEERS

INDEX

VOLUME 124

1959

SUBJECT INDEX, PAGE 1084

AUTHOR INDEX, PAGE 1113

Titles of papers are in quotation marks when given with the author's name.

VOLUME 124

SUBJECT INDEX

ACCELERATION
See VELOCITY... (cross references thereunder); *see also* VIBRATION

ACCOUNTS AND ACCOUNTING
See COMPUTATION AND COMPUTERS; COSTS...; VALUATION; *also* subheading Financing under relative subject

ADDRESSES
See AMERICAN SOCIETY OF CIVIL ENGINEERS—Addresses; *see also* under subject of address

AERIAL...
See AIR...

AGGREGATES AND AGGREGATION
Aggregate sources as a problem in alluvial deposits of Mississippi River valley, 644.

AGRICULTURE
See DRAINAGE; FLOOD...; IRRIGATION; RUNOFF; SOIL...

AIRCRAFT
See BUCKLING

AIR DEMAND
See CONDUITS

AIR ENTRAINMENT
See WATER, FLOW OF...

AIRFIELDS
See AIRPORTS

AIR FLOW
"Turbulence Characteristics of the Hydraulic Jump," Hunter Rouse, Tien To Siao and S. Nagaratnam (with discussion), 926.

AIRPORTS (structures and localities)
See also PAVEMENT AND PAVING...
"Ground Transportation at New York International Airport," Richard I. Strickland, 657.
Northern New Jersey-New York regional airports and nearby tunnel and bridge structure locations, 658, 659, 665.

AIR TERMINALS
See AIRPORTS

AIR TRANSPORT
See AIR TERMINALS (cross reference thereunder); TRANSPORTATION

ALLUVIATION
See BARS (alluvia); EROSION...; VALLEYS

AMERICAN SOCIETY OF CIVIL ENGINEERS (General)
Concise statement of the Society's policies, performance and projected program, 1038.

Addresses
1959—Annual Address at the Convention, Cleveland, Ohio, May 5, 1959, Francis S. Friel, 1038.

Memoirs of Members. *See* name of member in Author Index. (*See also* p. 1047)

ANALOG COMPUTERS
See ELECTRONIC INSTRUMENTS; *see also* under relative subject

ANALOGS AND ANALOGIES
See under relative subject

ANALYSIS, DESIGN
See under relative subject, e.g., VIBRATION; WELLS

ANALYSIS OF DATA
See EQUATIONS; MATHEMATICS; STRUCTURES, THEORY OF; *also* under relative subject, e.g., WAVES

ANALYSIS, STRUCTURAL
See EQUATIONS; STRESS AND STRAIN; STRUCTURES, THEORY OF

APPARATUS
See under relative subject; *also* INSTRUMENTS (cross references thereunder); *also* under general types of apparatus, e.g., VIBRATION RECORDING APPARATUS

APPARATUS, DEFLECTION RECORDING
See DEFLECTION RECORDING APPARATUS

APPRAISAL
See VALUATION
ARCH BRIDGES
See BRIDGES, ARCH
ARCHES
See also BRIDGES; BRIDGES, ARCH; STRESS AND STRAIN—Arches; TRUSSES, ARCH
"Design of Flexible Steel Arches by Interaction Diagrams," Haaren A. Miklofsky and Omar J. Sotillo, 1. *Discussion:* Reinaldo Garcia-Iturbe; and Haaren A. Miklofsky and Omar J. Sotillo, 30.
ARCHITECTS AND ARCHITECTURE
See type of structure or structural part, BRIDGES; BUILDINGS
ARCH TRUSSES
See TRUSSES, ARCH
ASSOCIATIONS
See AMERICAN SOCIETY OF CIVIL ENGINEERS
ATMOSPHERIC PRESSURE
"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.
ATOMIC BLAST
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.
AUTOMOBILE...
See also MOTOR...; TRAFFIC...
AUTOMOBILE PARKING
See also COSTS, AUTOMOBILE PARKING
"Ground Transportation at New York International Airport," Richard I. Strickland, 657.
BACTERIA
"Sewage Disposal in Santa Monica Bay," Charles G. Gunnerson (with discussion), 823.
BANKS AND BANK PROTECTION, RIVER
See RIVER BANKS AND BANK PROTECTION (cross references thereunder)
BARS (alluvia)
"Engineering Geology of the Mississippi Valley," Charles R. Kolb and Woodland G. Shockley (with discussion), 633.
BASE SLABS
See SLABS
BASINS (depression in earth's surface)
See DRAINAGE; RESERVOIRS ...; RUNOFF; VALLEYS
BASINS, STILLING
See WATER, FLOW OF, IN OPEN CHANNELS
BEACHES
See EROSION, BEACH; SHORES AND SHORE PROTECTION
BEACH SLOPES
See SHORES AND SHORE PROTECTION
BEAMS (General)
See also BUCKLING; FAILURES, BEAM; STRESS AND STRAIN—Beams; STRUCTURES, THEORY OF—Beams and Girders (General); TORSION; WHEEL LOADS; *also* under structure or structural part, e.g., BRIDGES...
"Strength of Very Slender Beams," Ernest F. Masur, 63.
BEAMS, CONTINUOUS
See STRUCTURES, THEORY OF—Beams and Girders, Continuous; WHEEL LOADS
BEARING CAPACITY (foundations, rocks, soils)
For more general interpretation *see* cross references under LOAD
"Compacting Earth Dams with Heavy Tamping Rollers," Jack W. Hilf, 409. *Discussion:* Jack D. Hodgson; C. Y. Li; and Jack W. Hilf, 436.
Origin and use of USBR rollers (including sheepsfoot rollers), 410.
Tamping roller specifications (1959) and sheepsfoot roller compaction test results on 44 dams with various type soils in United States, 411, 438.
"Thixotropic Characteristics of Compacted Clays," H. Bolton Seed and Clarence K. Chan (with discussion), 894.
Bibliography
Compacting earth dams with tamping rollers, 434.
BEARINGS
"Fixed-Wheel Gates for Penstock Intakes," Sylvan J. Skinner (with discussion), 740.

BENDING
See BUCKLING; MOMENTS; STRESS AND STRAIN; *also* under relative structure, structural part or material, e.g., BEAMS

BIBLIOGRAPHY
See subheading Bibliography under relative subject. (Comprehensive bibliographical footnotes existing in individual papers in which books and other material are cited)

BIOGRAPHIES OF DECEASED MEMBERS
See cross reference under MEMOIRS OF DECEASED MEMBERS. (*See also* p. 1047)

BLAST, ATOMIC
See ATOMIC BLAST

BLASTING
"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.
Effective usage of air bubble screen to prevent shock pressure wave damage in underwater blasting, 455.

BOUNDARY LAYER, THEORY OF (fluid flow)
See WATER, FLOW OF...

BRACING
See TRUSSES (cross reference thereunder)

BREAKWATERS
See also SHORES AND SHORE PROTECTION; WAVES
"Offshore Breakwaters," Richard Silvester, 356.

BRIDGES (General)
See also BEAMS...; IMPACT; PILES AND PILE DRIVING (cross references thereunder); STRESS AND STRAIN—Bridges; STRUCTURES, THEORY OF—Bridges...; TRAFFIC, BRIDGE; TRUSSES...; VIBRATION; WATER, FLOW OF, IN OPEN CHANNELS; WHEEL LOADS

BRIDGES, ARCH
See also ARCHES
Design of the two hinged Rainbow Bridge at Niagara gorge of Niagara River, 15.

BRIDGES, GIRDER
See STRESS AND STRAIN—Bridges, Girder; STRUCTURES, THEORY OF—Bridges, Girder; VIBRATION

BRIDGES, MOVABLE (TRANSFER)
"Characteristics of New-Type Cargo Ships," Douglas C. MacMillan, 179.

BRIDGE TRAFFIC
See TRAFFIC, BRIDGE

BUBBLES
See VISCOSITY

BUCKLING
"Plate Buckling in the Strain-Hardening Range," Geerhard Haaijer, 117.
"Pressure Lines and Inelastic Buckling of Columns," Frank Baron and Harold S. Davis, 967.
"Prestressed Truss-Beams," Ralph L. Barnett, 472.
"Strength of Very Slender Beams," Ernest F. Masur, 63.

BUILDING (process)
See CONSTRUCTION (cross references thereunder)

BUILDING MATERIALS
See MATERIALS OF CONSTRUCTION (cross references thereunder)
See also FAILURES, BUILDING...; STRESS AND STRAIN...; STRUCTURES...; VIBRATION; *also* under type of building, e.g., AIRPORTS
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams, 669. *Discussion:* DeForest A. Matteson, Jr.; and Jack R. Benjamin and Harry A. Williams, 703.
"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.

BULKHEADS
See SHORES AND SHORE PROTECTION; WAVES

CALCULATION AND CALCULATORS
See COMPUTATION AND COMPUTERS

CANALS (General)
See also CHANNELS (cross references thereunder); LOCK-GATES; LOCKS; TOLLS; TRAFFIC, CANAL; WATER, FLOW OF, IN OPEN CHANNELS; WATER TRANSPORTATION; WATERWAYS (cross references thereunder); WAVES

CANALS (Geographical)
Welland Ship Canal
History of first, second, third and fourth Welland Ship Canals, with chronological data, 443.

CANALS (Geographical) (*Continued*)
"The Welland Canal," William A. O'Neil, 443.

CARGO SHIPS
See SHIPS AND SHIPPING (cross reference thereunder)

CARRIERS
See COSTS...; MOTOR...; TRANSPORTATION; WATER TRANSPORTATION

CARS
See AUTOMOBILE...; MOTOR ...; TRAFFIC...; WHEEL LOADS

CAR WHEELS
See WHEEL LOADS

CATERPILLAR GATES
See INTAKE GATES (cross reference thereunder)

CAVITATION
Damage during prototype testing with possible prevention procedures indicated, 505.

CEMENT
See AGGREGATES AND AGGREGATION; CLAY; *also* under structure

CEMENT PAVEMENT AND PAVING
See PAVEMENT AND PAVING, CEMENT

CHANNEL BANKS AND BANK PROTECTION
See WATER, FLOW OF, IN OPEN CHANNELS; WAVES

CHANNELIZATION
See TRAFFIC, HIGHWAY AND ROAD

CHANNEL RECTIFICATION
See BARS (alluvia); WATER, FLOW OF, IN OPEN CHANNELS

CHANNELS (waterways)
See HYDRAULIC JUMP; RIVERS; WATER, FLOW OF, IN OPEN CHANNELS

CHARTS
See under relative subject

CHEMISTRY
See under relative technical subject, e.g., CORROSION AND PROTECTION OF METALS

CHLORINATORS AND CHLORINATION
"Sewage Disposal in Santa Monica Bay," Charles G. Gunnerson (with discussion), 823.

CITIES
See AIRPORTS; AUTOMOBILE PARKING; BUILDINGS; COSTS ...; EMPLOYEES AND EMPLOYMENT; EXPRESSWAYS (cross reference thereunder); FIRE ... (cross reference thereunder); FREIGHT; GAS AND GASWORKS; GOVERNMENT (cross references thereunder); INDUSTRIAL...; PUBLIC UTILITIES; SEWAGE...; SEWERS; STREETS; TERMINALS (cross references thereunder); TRAFFIC, STREET; WATER SUPPLY; *also* geographical subheadings under relative subject, e.g., HARBORS—Madras, India

CIVIL ENGINEERS AND ENGINEERING
See AMERICAN SOCIETY OF CIVIL ENGINEERS; ENGINEERS AND ENGINEERING

CLASSIFICATION OF SOILS
See SOILS—Classification

CLAY
See also SHEAR; SOIL...
"Review of the Theories for Sand Drains," F. E. Richart, Jr. (with discussion), 709.
"Thixotropic Characteristics of Compacted Clays," H. Bolton Seed and Clarence K. Chan, 894. *Discussion:* Edward S. Barber; D. P. Krynine; and H. Bolton Seed and Clarence K. Chan, 917.

COAST
See SEACOAST (cross references thereunder)

COASTER GATES
See INTAKE GATES (cross reference thereunder)

COATINGS, PROTECTIVE
See CORROSION AND PROTECTION OF METALS

CODES (law codes)
See LAW (cross reference thereunder)

COLUMNS
See BUCKLING; FAILURES, COLUMN; STRESS AND STRAIN—Columns

COMMERCE
See AIRPORTS; AIR TRANSPORT (cross references thereunder); CANALS; CHANNELS (cross references thereunder); CITIES (cross references thereunder); FREIGHT; HARBORS; HIGHWAYS AND ROADS; RIVERS; TERMINALS (cross references thereunder); TRANSPORTATION; WATER TRANSPORTATION; WATERWAYS (cross references thereunder); and other relative subject headings

COMPACTION
See BEARING CAPACITY; IMPACT; SOILS

COMPRESSION
See STRESS AND STRAIN

COMPRESSION MEMBERS
See COLUMNS

COMPRESSION TESTS, SOILS
See SOILS—Tests and Testing

COMPRESSORS AND COMPRESSION
See under relative type

COMPUTATION AND COMPUTERS
See ELECTRONIC INSTRUMENTS
"Electronic Computers in Surveying," Arthur J. McNair, 252.
Numerical procedures as aids in solving soil consolidation problems, 709, 737.
Reservoir Control Center (Omaha, Nebraska), operations applying electronic computers for analyses procedure solutions, 390.

COMPUTERS, DIGITAL
See ELECTRONIC INSTRUMENTS

COMPUTERS, ELECTRONIC
See COMPUTATION AND COMPUTERS; ELECTRONIC INSTRUMENTS; *see also* under relative subject

CONCRETE (General)
See also AGGREGATES AND AGGREGATION; CEMENT (cross references thereunder); GRAVEL; PAVEMENT AND PAVING, CONCRETE; SAND; SEEPAGE; SLABS; STRESS AND STRAIN—Concrete (General); *also* under special structure or structural part, e.g., WALLS (cross references thereunder)

Cracks and Cracking
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.

Tests and Testing
"Inelastic Behavior of Impulsively Loaded Beams," Melvin J. Greaves and Frederic T. Mavis, 395.

CONCRETE-METAL
See cross reference under REINFORCED CONCRETE

CONCRETE PAVEMENT AND PAVING
See PAVEMENT AND PAVING, CONCRETE

CONCRETE, REINFORCED
See CONCRETE...

CONDUITS
See also PENSTOCKS; PIPE LINES; TUNNELS...
"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.
"Fixed-Wheel Gates for Penstock Intakes," Sylvan J. Skinner (with discussion), 740.

CONSOLIDATION TESTS, SOIL
See SOILS—Tests and Testing

CONSTRICTION
See WATER, FLOW OF...

CONSTRUCTION
See BUILDINGS; COSTS...; EXCAVATION...; FAILURES...; MATERIALS OF CONSTRUCTION (cross references thereunder); STRESS AND STRAIN...; STRUCTURES, THEORY OF...; *also* under type of construction, e.g., POWER PLANTS

CONSTRUCTION MATERIALS
See MATERIALS OF CONSTRUCTION (cross references thereunder)

CONTAINERSHIPS
See SHIPS AND SHIPPING (cross reference thereunder)

CONTINUOUS BEAMS
See BEAMS, CONTINUOUS (cross references thereunder)

CONTINUOUS FRAMES
See STRESS AND STRAIN—Frames, Continuous; *see also* BEAMS...; COLUMNS (cross references thereunder)

CONTINUOUS STRUCTURES
See STRUCTURES, THEORY OF ...

CONTRACTION
See under relative subject
CONTROL AND CONTROLLERS
See WATER, FLOW OF, THROUGH ORIFICES
CONVENTIONS (American Society of Civil Engineers)
See AMERICAN SOCIETY OF CIVIL ENGINEERS—Addresses
CORROSION AND PROTECTION OF METALS
Steel galvanizing for underwater usage, 1024, 1025.
COSTS (General)
See also subheading Financing under relative subject
COSTS (of work)
See COSTS...
COSTS, AUTOMOBILE PARKING
Airport entrance automatic equipment in parking lots as related to costs, 667.
COSTS, CRANE, DERRICK AND POWER SHOVEL
Crane usage economy, 1011.
COSTS, DAM
Rock fill dam types compared as to costs, 992, 1022.
COSTS, DREDGING
Economical dredging for littoral drift deposit removal, 535.
COSTS, FREIGHT SERVICE
Prepacked container shipments in relation to cost, 179, 180, 181, 188, 190, 191.
COSTS, HIGHWAY AND ROAD
Partial cloverleaf versus diamond interchanges in relation to cost and operational safety, 592.
Typical highway program planning cost percentage breakdowns, 156.
COSTS, HYDRAULIC WORK
Purpose of field tests in relation to costs, 491.
COSTS, INSURANCE
"Technical Problems of Flood Insurance," H. Alden Foster (with discussion), 366.
COSTS, INTAKE GATE
Fixed wheel and coaster gate costs compared, 741, 743, 759.
COSTS, POWER PLANT
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.
COSTS, SOIL TESTING
Compacting various soil types by tamping rollers (including earth dam water barrier sections), 434, 439, 441.
COSTS, UNDERGROUND STRUCTURE
Powerhouse constructed underground for economic reasons, 989, 990, 1005, 1023.
COSTS, WATER SUPPLY
Water costs in California, 229, 230, 231, 234.
COURT DECISIONS
See under relative subject (under the subject LAW heading)
CRACKS AND CRACKING
See under relative subject, e.g., CONCRETE—Cracks and Cracking
CRANES, DERRICKS AND POWER SHOVELS
See also COSTS, CRANE, DERRICK AND POWER SHOVEL
Crane requirements for newer type cargo ship usage, 192.
CREEP
See STRESS AND STRAIN
CRIPPLING
See FAILURES
CROSS SECTIONS
See under relative subject
CULVERTS
"The Welland Canal," William A. McNeil, 443.
CURRENTS
See ELECTRIC POWER (cross reference thereunder); OCEAN CURRENTS; RIVERS; WATER DIVERSION; WAVES
CURVES (design curves)
See relative subject of design, e.g., BEARING CAPACITY
CURVES (elastic curves)
See STRUCTURES, THEORY OF
CURVES, FREQUENCY
See under topic, e.g., FLOODS
CURVES, WAVE RUN UP
"Wave Run-Up on Roughened and Permeable Slopes," Rudolph P. Savage, 852.
CUTOFFS, TRANSPORTATION
See HIGHWAYS AND ROADS
DAMPING
See STRESS AND STRAIN; STRUCTURES, THEORY OF; VISCOSITY

DAMS (General)
See also COSTS, DAM; LOCKS; MODELS, HYDRAULIC; RESERVOIRS; SPILLWAYS; VALVES; WATER DIVERSION; WATER, FLOW OF, OVER DAMS AND WEIRS; WATER PRESSURE
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.

DAMS, EARTH
See also SEEPAGE; WAVES
"Compacting Earth Dams with Heavy Tamping Rollers," Jack W. Hilf (with discussion), 409.
Bibliography
Compacting with heavy tamping rollers for various soil types, 434.

DAMS, FIXED
See DAMS, EARTH; DAMS, ROCK-FILL

DAMS, MASONRY AND CONCRETE
See SEEPAGE; UPLIFT, HYDROSTATIC (cross reference thereunder); WATER PRESSURE

DAMS, ROCK-FILL
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.

DEFINITIONS
See TERMINOLOGY

DEFLECTION RECORDING APPARATUS
Deflectometers used in testing dynamic deflections in girder bridges, 299.

DEFLECTIONS
See DEFORMATION (cross references thereunder); MOMENTS; STRESS AND STRAIN; STRUCTURES, THEORY OF; VIBRATION; *also* under relative structure or structural part, e.g., BEAMS; BUILDINGS

DEFORMATION
See FAILURES . . . ; STRESS AND STRAIN; STRUCTURES, THEORY OF; *also* under specific type of stress, e.g., TORSION; *also* under type of material, e.g., CLAY; *also* under type of structure, e.g., BUILDINGS

DELTAS
See RIVER DELTAS

DEPRECIATION
See VALUATION

DESIGN
See under relative subject, e.g., ARCHES; BRIDGES, MOVABLE; *see also* STRUCTURES, THEORY OF

DESIGN ANALYSIS
See under relative subject, e.g., VIBRATION; WELLS

DESIGN CURVES
See CURVES (design curves) (cross reference thereunder)

DIAGRAMS
See under relative subject, e.g., ARCHES; WELLS

DIGITAL COMPUTERS
See ELECTRONIC INSTRUMENTS; *see also* under relative subject

DIKES
See RIVER BANKS AND BANK PROTECTION (cross references thereunder)

DISCHARGE
See PUMPS AND PUMPING; SLUICES; WATER, FLOW OF . . .

DISCHARGE COEFFICIENTS
See under relative subject, e.g., WATER, FLOW OF . . .

DISINTEGRATION OF MATERIALS
See CORROSION AND PROTECTION OF METALS

DISTORTION
See STRESS AND STRAIN; TORSION

DIVERSION
See WATER DIVERSION

DIVERSION DAMS
See DAMS

DOCKS AND WHARVES
See BULKHEADS (cross references thereunder); HARBORS; PILES AND PILE DRIVING (cross references thereunder); WATER TERMINALS

DRAINAGE
See also RUNOFF; SEWERS; VALLEYS; WELLS
White River Basin, Indiana as a typical humid region area, 285.

DRAINAGE BASINS
See DRAINAGE

DRAIN WELLS
See WELLS

DRAWINGS
See under relative subject
DREDGES AND DREDGING
See also COSTS, DREDGING; EXCAVATION, HYDRAULIC
"Littoral-Drift Problem at Shore-Line Harbors," Joe W. Johnson (with discussion), 525.
DRIFT, LITTORAL
See SHORES AND SHORE PROTECTION
DROP-DOWN
See also SPILLWAYS; WATER, FLOW OF, IN OPEN CHANNELS
"Model Studies of Remedial Works for Niagara Falls," Andrew P. Rollins, Jr. and George B. Fenwick, 236.
DROP STRUCTURES
See DAMS
DYNAMICS OF FLUIDS
See HYDRODYNAMICS
DYNAMICS OF STRUCTURES
See STRUCTURAL DYNAMICS
EARTH...
See also GROUND...; SOIL...
EARTH DAMS
See DAMS, EARTH
EARTH PRESSURE
"Compacting Earth Dams with Heavy Tamping Rollers," Jack W. Hilf (with discussion), 409.
EARTHQUAKES
See VIBRATION...
EARTHS
See SOILS
EARTHWORK
See DAMS, EARTH; EXCAVATIONS; FOUNDATIONS...; LEVEES; SOILS
ECONOMICS
See COSTS...; VALUATION; *also* under relative subject, subheading Financing
EDDIES
See WATER, FLOW OF, IN OPEN CHANNELS; WATER, FLOW OF, THROUGH ORIFICES
EDUCATION
Electronic computers in teaching surveying, 255.
EFFLUENTS, SEWAGE
See SEWAGE DISPOSAL
ELASTIC CURVES
See CURVES (elastic curves) (cross reference thereunder)
ELASTICITY
See also PLASTICITY; STRESS AND STRAIN
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.
"Prestressed Truss-Beams," Ralph L. Barnett, 472.
"Strength of Very Slender Beams," Ernest F. Masur, 63.
ELECTRIC GENERATORS
"Generating Station on the Niagara River," Frank Dobson, 32.
ELECTRIC POWER (General)
See POWER...; PUBLIC UTILITIES
ELECTRIC POWER PLANTS
See POWER PLANTS
ELECTRONIC COMPUTERS
See COMPUTATION AND COMPUTERS; ELECTRONIC INSTRUMENTS; *see also* under relative subject
ELECTRONIC INSTRUMENTS
See also COMPUTATION AND COMPUTERS...; SURVEYS AND SURVEYING
Digital computers used to simplify rapid gas flow formula application, 341.
"Vibration of Simple-Span Highway Bridges," John M. Biggs, Herbert S. Suer and Jacobus M. Louw, 291.
EMBANKMENTS
See DAMS, EARTH; LEVEES; ROCK; SOILS
EMPLOYEES AND EMPLOYMENT
Mode of ground transportation for employees at New York International Airport, 660.
ENERGY
See ELECTRIC POWER (cross references thereunder); HYDRODYNAMICS; KINETIC ENERGY (cross references thereunder); POWER; STRUCTURAL DYNAMICS; STRUCTURES, THEORY OF; WATER, FLOW OF ...; WATER POWER; WIND

ENERGY, KINETIC
See DYNAMICS... (cross references thereunder); IMPACT
ENERGY, LOSS OF
See FRICTION...; HYDRAULIC JUMP; WATER, FLOW OF; WATER HAMMER
ENGINEERING
See ENGINEERS AND ENGINEERING
ENGINEERING BIBLIOGRAPHY
See BIBLIOGRAPHY (cross references thereunder)
ENGINEERING EDUCATION
See EDUCATION
ENGINEERING GLOSSARIES
See TERMINOLOGY
ENGINEERING HISTORY
See AMERICAN SOCIETY OF CIVIL ENGINEERS; *also* under relative subject, e.g., CANALS; PIPE LINES
ENGINEERING SOCIETIES
See AMERICAN SOCIETY OF CIVIL ENGINEERS
ENGINEERS AND ENGINEERING (General)
See also AMERICAN SOCIETY OF CIVIL ENGINEERS. (For memoirs of deceased members, *see* name of member in Author Index.) (*See also* p. 1047); EDUCATION; RESEARCH; TERMINOLOGY
United Engineering Center fund raising campaign reviewed as engineering activity stimulus, 1038.
ENGINES, STEAM
See TURBINES, STEAM
ENTRAINMENT, AIR
See WATER, FLOW OF...
EQUATIONS
See also under relative subject, e.g., WATER, FLOW OF...
"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.
Empirical equations discounted, 818, 821.
Simultaneous equations solved rapidly by electronic computers, 252.
ERECTION
See CONSTRUCTION (cross references thereunder)
EROSION, BEACH
"Offshore Breakwaters," Richard Silvester, 356.
EROSION, TAIL WATER
"Hydraulic Jump at an Abrupt Drop," Walter L. Moore and Carl W. Morgan (with discussion), 507.
ESTIMATES
See COSTS
EVALUATION
See VALUATION
EXCAVATION (General)
See also EARTHWORK (cross references thereunder); FOUNDATIONS...
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.
EXCAVATION, HYDRAULIC
See also DREDGES AND DREDGING
Methods used for Welland Ship Canal, 454, 456.
EXPERIMENTS AND EXPERIMENTATION
See MODELS...; TESTS AND TESTING (cross references thereunder); *also* under material, structure or structural part tested; *also* under relative subject
EXPLOSION
See BLASTING
EXPLOSION, ATOMIC
See ATOMIC BLAST
EXPLOSIVES
See BLASTING
EXPRESSWAYS
See HIGHWAYS AND ROADS
FABRICATION
See under relative subject, e.g., BRIDGES, ARCH; *see also* CONSTRUCTION (cross references thereunder)
FACT FINDING
See RESEARCH
FACTOR, ROUGHNESS
See cross reference under ROUGHNESS FACTOR
FAILURES (General)
See also STRENGTH OF MATERIALS; STRESS AND STRAIN; STRUCTURES, THEORY OF; *also* under relative subject, e.g., BUILDINGS
FAILURES, BEAM
"Prestressed Truss-Beams," Ralph L. Barnett, 472.

FAILURES, BUILDING WALL
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.
FAILURES, COLUMN
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
FAILURES, CONCRETE
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
FAILURES, FOUNDATION
"Tests to Evaluate Concrete Pavement Subbases," Lawrence D. Childs, Bert E. Colley, and Joe W. Kapernick, 556.
FAILURES, PAVEMENT AND PAVING
Pavement design procedures in relation to cause of failures, 908.
FAILURES, PILE
"Ocean-Wave Forces on Circular Cylindrical Piles," Robert L. Wiegel, Kenneth E. Beebe, and James Moon (with discussion), 89.
FAILURES, STEEL
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
FATIGUE
See under relative subject; *see also* FAILURES
FINANCE
See COSTS...; VALUATION; *see also* subheading Financing under relative subject, e.g., HIGHWAYS AND ROADS—Financing
FIRE PROTECTION
See WATER SUPPLY
FISH INDUSTRY
See under relative technical subject, e.g., RESERVOIRS; WATER POLLUTION
FIXED DISPERSION CONES
See VALVES
FIXED WHEEL GATES
See INTAKE GATES (cross reference thereunder)
FLANGES
See STRESS AND STRAIN—Flanges
FLEXURE
See STRESS AND STRAIN
FLOOD CONTROL
See FLOOD ROUTING; RESERVOIRS, FLOOD CONTROL
FLOOD FORECASTING
See FLOODS
FLOOD LAW
Development of 1928 Mississippi River control plan and its relation to Flood Control Act of 1928 (and 1936 and 1941 and other amendments), 215, 216, 217.
FLOOD ROUTING
"Evolution of Mississippi Valley Flood-Control Plan," John R. Hardin, 207.
Flood control methods grouped in six major categories, 212.
FLOODS (General)
See also INSURANCE; LEVEES; RUNOFF; VALUATION
Statistical methods in estimating flood frequencies, 367.
FLOW
See AIR FLOW; FLOODS; RUNOFF; SEWERS; TURBULENCE; WATER, FLOW OF...
FLOW, LAMINAR
See WATER, FLOW OF, IN OPEN CHANNELS
FLOW METERS
See WEIRS (cross reference thereunder)
FLOW OF FLUIDS
See GAS...; WATER, FLOW OF ...
FLOW OF WATER
See WATER, FLOW OF...
FLOW, SEPARATION OF
See WATER, FLOW OF, IN OPEN CHANNELS
FLUID DYNAMICS
See HYDRODYNAMICS
FLUID FRICTION COEFFICIENTS
See FRICTION COEFFICIENTS, FLUID
FLUID MECHANICS
See WATER, FLOW OF...
FLUIDS, DYNAMICS OF
See HYDRODYNAMICS
FLUIDS, FLOW OF
See GAS...; WATER, FLOW OF ...

FLUMES
See also WATER, FLOW OF, IN OPEN CHANNELS
Measurement errors in Parshall flume discharge, 322, 327, 337.
Venturi flume advantages, 337, 340.

FORMULAS
See under relative subject, e.g., FLOW OF FLUIDS (cross references thereunder)

FOUNDATIONS (General)
See also FAILURES, FOUNDATION; PILES AND PILE DRIVING (cross reference thereunder); STRESS AND STRAIN—Foundations

FOUNDATIONS, UNDERWATER
"Engineering Geology of the Mississippi Valley," Charles R. Kolb and Woodland G. Shockley (with discussion), 633.

FRAMES (General)
See STRESS AND STRAIN—Frames

FRAMES, CONTINUOUS
See STRESS AND STRAIN—Frames, Continuous; *see also* BEAMS ...

FRAMES, RIGID
See STRESS AND STRAIN—Frames, Rigid

FREEWAYS
See HIGHWAYS AND ROADS—Location

FREIGHT
See also COSTS, FREIGHT SERVICE; MOTOR TRUCKS (cross reference thereunder)
"Characteristics of New-Type Cargo Ships," Douglas C. MacMillan, 179.

FREQUENCY CURVES
See under topic, e.g., FLOODS

FRICTION
"Errors in Measurement of Irrigation Water," Charles W. Thomas (with discussion), 319.
"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.
"Flow Equations for Natural Gas Pipelines," Richard F. Bukacek (with discussion), 1027.
"Wave Run-Up on Roughened and Permeable Slopes," Rudolph P. Savage, 852.

FRICTION COEFFICIENTS
"Fixed-Wheel Gates for Penstock Intakes," Sylvan J. Skinner (with discussion), 740.

FRICTION COEFFICIENTS, FLUID
"Flow of Natural Gas in Pipelines," William T. Ivey and James H. Dorough, 341.

GAGES, PRESSURE
"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.

GAGES, STRAIN
"Ocean-Wave Forces on Circular Cylindrical Piles," Robert L. Wiegel, Kenneth E. Beebe, and James Moon (with discussion), 89.
"Vibration of Simple-Span Highway Bridges," John M. Biggs, Herbert S. Suer and Jacobus M. Louw, 291.

GAGES, STREAM
See also WATER LEVEL RECORDING AND INDICATING INSTRUMENTS
"Errors in Measurement of Irrigation Water," Charles W. Thomas (with discussion), 319.

GAGING
See WATER, FLOW OF, IN OPEN CHANNELS

GAS AND GASWORKS
See also PIPE LINES
Design flow equations most widely used, 1028.
"Flow Equations for Natural Gas Pipelines," Richard F. Bukacek (with discussion), 1027.

GAS DISTRIBUTION
See GAS AND GASWORKS

GATES
See under type of gate, e.g., LOCK-GATES; WATER GATES...

GENERATORS
See ELECTRIC GENERATORS

GEOLOGY
"Engineering Geology of the Mississippi Valley," Charles R. Kolb and Woodland G. Shockley, 633. *Discussion:* Shu-T'ien Li; Charles R. Kolb and Woodland G. Shockley, 646.

GEOMETRY
See under relative subject, e.g., WATER, FLOW OF, OVER DAMS AND WEIRS

GIRDER BRIDGES
See BRIDGES, GIRDER (cross references thereunder)

GIRDERS (General)
See STRESS AND STRAIN; STRUCTURES, THEORY OF
GIRDERS, CONTINUOUS
See STRUCTURES, THEORY OF
GLOSSARIES
See TERMINOLOGY
GOVERNMENT
See PUBLIC...; *see also* LAW subject heading under related topic, e.g., HIGHWAY AND ROAD LAW
GRAVEL
See also SOILS
"Engineering Geology of the Mississippi Valley," Charles R. Kolb and Woodland G. Shockley (with discussion), 633.
GROUND...
See also EARTH...; SOIL...
GROUND WATER
See also WATER SUPPLY
"Salt Balance in Ground-Water Reservoirs," David B. Willets and Charles A. McCullough (with discussion), 224.
HARBOR POLLUTION
See WATER POLLUTION
HARBORS (General)
See also SHORES AND SHORE PROTECTION
HARBORS (Geographical)
California
Littoral drift problems, 525.
Madras, India
Littoral drift problems, 529, 536, 545, 546, 552.
HEAD, LOSS OF
See FRICTION; WATER, FLOW OF...
HIGHWAY AND ROAD LAW
"Highway Planning in the Past, Present, and Future," Edward H. Holmes and John T. Lynch, 149.
HIGHWAY BRIDGES
See BRIDGES (cross reference thereunder)
HIGHWAYS AND ROADS (General)
See also BRIDGE...; COSTS, HIGHWAY AND ROAD; FOUNDATIONS, HIGHWAY AND ROAD; MOTOR...; PAVEMENT AND PAVING...; TRAFFIC, HIGHWAY AND ROAD; VEHICLES (cross reference thereunder)
Costs. *See* COSTS, HIGHWAY AND ROAD
Financing
State highway planning surveys initiated through federal aid financing, 151.
Location
"Adaptability of Interchanges to Interstate Highways," Jack E. Leisch (with discussion), 588.
Planning and Design
"Adaptability of Interchanges to Interstate Highways," Jack E. Leisch, 588. *Discussion:* Gerald D. Love; and Jack E. Leisch, 614.
"Highway Planning in the Past, Present, and Future," Edward H. Holmes and John T. Lynch, 149.
Research
"Highway Planning in the Past, Present, and Future," Edward H. Holmes and John T. Lynch, 149.
Traffic. *See* TRAFFIC, HIGHWAY AND ROAD
Transportation. *See* HIGHWAY TRANSPORTATION
New Jersey
"Ground Transportation at New York International Airport," Richard I. Strickland, 657.
New York
"Ground Transportation at New York International Airport," Richard I. Strickland, 657.
United States
"Highway Planning in the Past, Present, and Future," Edward H. Holmes and John T. Lynch, 149.
National wide through route numbering system adopted, 150.
HIGHWAY TRAFFIC
See TRAFFIC, HIGHWAY AND ROAD
HIGHWAY TRANSPORTATION
"Highway Planning in the Past, Present, and Future," Edward H. Holmes and John T. Lynch, 149.
HISTORY, ENGINEERING
See under relative subject, e.g., CANALS; PIPE LINES
HOISTING MACHINERY
See under specific type of machines, e.g., CRANES, DERRICKS AND POWER SHOVELS
HURRICANES
See WIND...

HYDRAULIC EXCAVATION

See EXCAVATION, HYDRAULIC

HYDRAULIC JUMP

"Hydraulic Jump at an Abrupt Drop," Walter L. Moore and Carl W. Morgan, 507. *Discussion:* Murray B. McPherson, John W. Forster, and Walter L. Moore and Carl W. Morgan, 517.

"Turbulence Characteristics of the Hydraulic Jump," Hunter Rouse, Tien To Siao and S. Nagaratnam, 926. *Discussion:* Edward Silberman; Alvin J. Peterka and Joseph N. Bradley; James M. Robertson; Donald R. F. Harleman; Philip G. Hubbard; and Hunter Rouse, Tien To Siao and S. Nagaratnam, 951.

Bibliography

Exhaustive bibliographic information cited on hydraulic jump under various channel and flow conditions, 516.

HYDRAULIC LABORATORIES

See MODELS, HYDRAULIC

HYDRAULIC MODELS

See MODELS, HYDRAULIC

HYDRAULICS

See BREAKWATERS; CHANNELS (cross references thereunder); COSTS...; DRAINAGE; DROP-DOWN; EROSION...; FAILURES...; FLOOD...; FLOW... (cross references thereunder); FLUID... (cross references thereunder); FLUMES; FRICTION...; GAGES...; GROUND WATER; HYDRO...; IRRIGATION; LEVEES; MODELS, HYDRAULIC; PILES AND PILE DRIVING (cross references thereunder); PIPE...; POWER...; PUMPS AND PUMPING; RESERVOIRS...; RIVER...; RUNOFF; SEA... (cross references thereunder); SEWERS; STRESS AND STRAIN...; TERMINOLOGY; VALLEYS; VALUATION; VISCOSITY; WATER...; WAVES

HYDRAULIC STRUCTURES

See also under type of structure, e.g., DAMS; SPILLWAYS

"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.

HYDRAULIC TURBINES

See TURBINES, WATER

HYDRODYNAMICS

"Attenuation of Solitary Waves on a Smooth Bed," Yoshiaki Iwasa, 193.

"Discharge Characteristics of Rectangular Thin-Plate Weirs," Carl E. Kindsvater and Rolland W. Carter (with discussion), 772.

"Hydraulic Jump at an Abrupt Drop," Walter L. Moore and Carl W. Morgan (with discussion), 507.

"Ocean-Wave Forces on Circular Cylindrical Piles," Robert L. Wiegel, Kenneth E. Beebe, and James Moon (with discussion), 89.

"Predicting Surge Pressures in Oil Pipelines," Robert D. Kersten and Edwin J. Waller (with discussion), 258.

"Turbulence Characteristics of the Hydraulic Jump," Hunter Rouse, Tien To Siao and S. Nagaratnam (with discussion), 926.

HYDROELECTRIC GENERATORS

See ELECTRIC GENERATORS

HYDROELECTRIC PLANTS

See POWER PLANTS

HYDROELECTRIC POWER

See WATER POWER

HYDROELECTRIC POWER PLANTS

See POWER PLANTS

HYDROLOGY

See DRAINAGE; FLOOD...; RIVERS; RUNOFF; WATER...

HYDROMETRY

See WATER DIVERSION; WATER, FLOW OF...

HYDROSTATIC PRESSURE

See HYDROSTATIC UPLIFT (cross reference thereunder)

HYDROSTATICS

See WATER PRESSURE

HYDROSTATIC UPLIFT

See WATER PRESSURE

IMPACT

See also VIBRATION; WHEEL LOADS

"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.

"Inelastic Behavior of Impulsively Loaded Beams," Melvin J. Greaves and Frederic T. Mavis, 395.

IMPULSE

See STRUCTURAL DYNAMICS

INDUSTRIAL PLANTS
See specific type of plant, e.g., POWER PLANTS

INDUSTRIAL WASTE
Radioactive waste products of a nuclear power station, 620.

INDUSTRIAL WATER SUPPLY
See IRRIGATION; RESERVOIRS ...; WATER SUPPLY

INDUSTRY
See under type of industry or industrial plant, e.g., FISH INDUSTRY (cross reference thereunder); GAS AND GASWORKS; POWER PLANTS

INFILTRATION
See GROUND WATER

INFLUENCE LINES
See MOMENTS

INSTRUMENTS
See GAGES; *also* under general types of instruments, e.g., ELECTRONIC INSTRUMENTS; *see also* cross references under APPARATUS; *see also* under usage

INSURANCE
See also COSTS, INSURANCE
Flood damage losses classified, 370.
"Technical Problems of Flood Insurance," H. Alden Foster, 366. *Discussion:* Geoffrey N. Alexander; Steponas Kolupaila; and H. Alden Foster, 376.

INTAKE GATES
See INTAKES

INTAKES
See also STRESS AND STRAIN—Intakes
Coaster caterpillar gate characteristics, 769.
"Fixed-Wheel Gates for Penstock Intakes," Sylvan J. Skinner, 740. *Discussion:* Joseph R. Bowman; and Sylvan J. Skinner, 769.
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.

IRRIGATION (General)
See also RESERVOIRS, IRRIGATION; WATER SUPPLY
"Errors in Measurement of Irrigation Water," Charles W. Thomas (with discussion), 319.
"Water Supply Versus Irrigation in Humid Areas," Marion C. Boyer, 280.

JETS
See WATER, FLOW OF, THROUGH ORIFICES

JUMP, HYDRAULIC
See HYDRAULIC JUMP

KINETIC ENERGY
See DYNAMICS... (cross references thereunder); IMPACT

LABORATORIES
See under specific type of laboratory, e.g., HYDRAULIC LABORATORIES (cross reference thereunder); *also* under relative subject; *also* under MODELS...; TESTS AND TESTING (cross references thereunder); *also* under material, structure, or structural part tested

LAMINAR FLOW
See WATER, FLOW OF, IN OPEN CHANNELS

LAND
See EARTH...; GROUND...; SOIL...

LAW
See LAW subject heading under relative subject, e.g., FLOOD LAW; HIGHWAY AND ROAD LAW

LEAST WORK, PRINCIPLE OF
See STRUCTURES, THEORY OF

LEGISLATION
See under relative subject (under the subject LAW heading, e.g., HIGHWAY AND ROAD LAW)

LEVEES
"Engineering Geology of the Mississippi Valley," Charles R. Kolb and Woodland G. Shockley (with discussion), 633.
"Evolution of Mississippi Valley Flood-Control Plan," John R. Hardin, 207.

LIQUIDS, FLOW OF
See WATER, FLOW OF...

LIQUIDS, FLOW OF, OVER WEIRS
See WATER, FLOW OF, OVER DAMS AND WEIRS

LIQUIDS, FLOW OF, THROUGH ORIFICES
See WATER, FLOW OF, THROUGH ORIFICES

LITTORAL DRIFT
See SHORES AND SHORE PROTECTION

LOAD
See ATOMIC BLAST; BEARING CAPACITY; BUCKLING; IMPACT; STRESS AND STRAIN; STRUCTURES, THEORY OF; WHEEL LOADS; *also* under structure, structural member or part, e.g., BEAMS

LOAD, SUSPENDED
See SILT AND SILTING

LOCK-GATES
"The Welland Canal," William A. O'Neil, 443.

LOCKS
"The Welland Canal," William A. O'Neil, 443.

LOSS OF ENERGY
See WATER, FLOW OF

LOSS OF HEAD
See FRICTION; WATER, FLOW OF...

MANOMETERS
See GAGES, PRESSURE

MARINE
See SEA...

MASONRY
See WALLS (cross references thereunder)

MASONRY DAMS
See DAMS, MASONRY AND CONCRETE (cross references thereunder)

MATERIALS OF CONSTRUCTION
See CLAY; FAILURES...; ROCK; SOILS; STEEL... (cross references thereunder); STRESS AND STRAIN...; STRUCTURES, THEORY OF...

MATERIALS, PERMEABILITY OF
See PERMEABILITY OF MATERIALS (cross references thereunder)

MATERIALS, STRENGTH OF
See STRENGTH OF MATERIALS

MATHEMATICS
See also COMPUTATION AND COMPUTERS; EQUATIONS; *see also* under relative subject
Continuous beam analysis by infinite trigonometric series (Fourier Series) and redundant reactions determined by Castigliano's theorem, 164.

MEANDERS AND MEANDERING
See RIVERS

MECHANICS, FLUID
See WATER, FLOW OF...

MEMBERS (ASCE)
See AMERICAN SOCIETY OF CIVIL ENGINEERS. (For memoirs of deceased members, *see* name of member in Author Index.) (*See also* p. 1047)

MEMBERS, STRUCTURAL
See BEAMS...; STRUCTURES, THEORY OF

MEMOIRS OF DECEASED MEMBERS
See name of member in Author Index. (*See also* p. 1047)

METAL PROTECTION
See CORROSION AND PROTECTION OF METALS

METALS
See CORROSION AND PROTECTION OF METALS

MINERALS
See under relative technical subject, e.g., GROUND WATER

MODELS, HYDRAULIC
Air flow model and procedure for determining mean flow patterns of the hydraulic jump, 936, 948, 952, 953, 954, 955, 957, 966.
"Model Studies of Remedial Works for Niagara Falls," Andrew P. Rollins, Jr. and George B. Fenwick, 236.
"Offshore Breakwaters," Richard Silvester, 356.
United States Army Corps of Engineers prototype testing advantages as opposed to model testing, 491.
"Vortex Flow Through Horizontal Orifices," John C. Stevens and Richard C. Kolf (with discussion), 871.

MODELS, STRUCTURAL
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
"Inelastic Behavior of Impulsively Loaded Beams," Melvin J. Greaves and Frederic T. Mavis, 395.
"Vibration of Simple-Span Highway Bridges," John M. Biggs, Herbert S. Suer and Jacobus M. Louw, 291.

MOMENT DISTRIBUTION
See MOMENTS

MOMENTS
See also STRESS AND STRAIN; STRUCTURES, THEORY OF; *also* under specific type of stress, e.g., BUCKLING; TORSION

MOMENTS (*Continued*)
"Analysis of Continuous Beams by Fourier Series," Seng-Lip Lee (with discussion), 164.
Influence line expressions derived by infinite trigonometric series, 170.
"Prestressed Truss-Beams," Ralph L. Barnett, 472.
MOMENTUM
See HYDRODYNAMICS; WATER, FLOW OF...
MOTOR TRUCKS
See TRAFFIC...; WHEEL LOADS
MOTOR VEHICLES
"Vibration of Simple-Span Highway Bridges," John M. Biggs, Herbert S. Suer and Jacobus M. Louw, 291.
MOTORWAYS
See HIGHWAYS AND ROADS
MOVABLE BRIDGES
See BRIDGES, MOVABLE
MOVABLE WATER GATES
See WATER GATES, MOVABLE
MULTI-PURPOSE RESERVOIRS
See RESERVOIRS, MULTI-PURPOSE
MUNICIPALITIES
See CITIES (cross references thereunder)
NAVIGATION
See BRIDGES; CANALS; FLOODS; RIVERS; WATER TRANSPORTATION
NAVIGATION LOCKS
See LOCKS
NETWORKS
See HIGHWAYS AND ROADS
NIAGARA GORGE
See RIVERS (Geographical)—Niagara River
NOMENCLATURE
See TERMINOLOGY
NONUNIFORM FLOW
See WATER, FLOW OF...
NOZZLES
See WATER, FLOW OF, THROUGH ORIFICES
NUCLEAR POWER PLANTS
See POWER PLANTS
OBITUARIES OF MEMBERS
See name of member in Author Index. (*See also* p. 1047)
OCEAN...
See also SEA...; WAVES
OCEAN BEACHES
See EROSION, BEACH; SHORES AND SHORE PROTECTION
OCEAN CURRENTS
See also EROSION, BEACH; WAVES
"Sewage Disposal in Santa Monica Bay," Charles G. Gunnerson (with discussion), 823.
OCEAN WAVES
See WAVES
OIL, FLOW OF
See PIPE LINES
OPEN CHANNELS
See WATER, FLOW OF, IN OPEN CHANNELS
ORGANIZATIONS
See AMERICAN SOCIETY OF CIVIL ENGINEERS
ORIFICES
See WATER, FLOW OF, THROUGH ORIFICES
OSCILLATION
See VIBRATION
OSCILLOGRAPHS
See VIBRATION RECORDING APPARATUS
PALLETS
See SHIPS AND SHIPPING (cross reference thereunder)
PARKING REGULATIONS
See AUTOMOBILE PARKING
PARSHALL FLUMES
See FLUMES
PAVEMENT AND PAVING (General)
See also STRESS AND STRAIN—Pavement and Paving
Bibliography
Concrete pavement testing, 585.
PAVEMENT AND PAVING, CEMENT
Predicting life of pavement in its relation to interval existing between compaction and testing, 908.
PAVEMENT AND PAVING, CONCRETE
"Tests to Evaluate Concrete Pavement Subbases," Lawrence D. Childs, Bert E. Colley, and Joe W. Kapernick, 556.

PENSTOCKS
"Fixed-Wheel Gates for Penstock Intakes," Sylvan J. Skinner (with discussion), 740.
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.

PERCOLATION
See SOILS

PERMEABILITY OF MATERIALS
See SEEPAGE; *also* under type of material, e.g., SOILS

PIEZOMETERS
See GAGES, PRESSURE

PILES AND PILE DRIVING
See FAILURES, PILE; STRESS AND STRAIN—Piles

PIPE LINES
See also PUMPS AND PUMPING; WATER HAMMER
Basic design formula proposed for natural gas flow, 351.
"Flow Equations for Natural Gas Pipelines," Richard F. Bukacek, 1027. *Discussion:* James H. Dorough; William T. Ivey; John F. Schomaker; and Richard F. Bukacek, 1035.
"Flow of Natural Gas in Pipelines," William T. Ivey and James H. Dorough, 341.
History of development of gas flow formulas in pipelines, 341.
"Predicting Surge Pressures in Oil Pipelines," Robert D. Kersten and Edwin J. Waller (with discussion), 258.

PIPES AND PIPING (fluid conveyance)
See PIPE LINES; SEWERS; WATER HAMMER

PLANNING
See under relative subject, e.g., FLOOD ROUTING; HIGHWAYS AND ROADS—Planning and Design

PLANTS (industrial buildings and equipment)
See under type of plant, e.g., POWER PLANTS

PLASTICITY
See also ELASTICITY; STRESS AND STRAIN
"Inelastic Behavior of Impulsively Loaded Beams," Melvin J. Greaves and Frederic T. Mavis, 395.
"Plate Buckling in the Strain-Hardening Range," Geerhard Haaijer, 117.

PLASTIC THEORY
See PLASTICITY

PLATES
See STRESS AND STRAIN—Plates

POLLUTION, STREAM
See WATER POLLUTION

POPULATION
United States population rapid growth trends, with reasons specified, 283.

PORE WATER PRESSURE
See WATER PRESSURE

POROSITY
See SEEPAGE

POWER (General)
See also ELECTRIC POWER (cross reference thereunder); PUMPS AND PUMPING; WATER POWER

POWER (Geographical)

North Central States
Power generation in Missouri River main-stem reservoir system power plants, years 1952–1956, 394.

POWER GENERATION
See POWER

POWER HOUSES
See POWER PLANTS

POWER PLANTS (General)
See also COSTS, POWER PLANT

Financing
Dresden Nuclear Power Station, near Morris, Illinois and its financing by private industry, 617.

POWER PLANTS (Geographical)

California
First large underground hydroelectric plant in the United States, 989, 1022.
"Haas Hydroelectric Power Project," J. Barry Cooke, 989. *Discussion:* F. L. Lawton; and J. Barry Cooke, 1024.

Canada
"Generating Station on the Niagara River," Frank Dobson, 32.

Illinois
"Design Features of the Dresden Nuclear Power Station," Joseph E. Love, Chester S. Darrow, and Burr H. Randolph, 617.

POWER STATIONS
See POWER PLANTS

PRESIDENTIAL ADDRESSES
(American Society of Civil Engineers)
See AMERICAN SOCIETY OF CIVIL ENGINEERS—Addresses

PRESSURE
See ATMOSPHERIC PRESSURE; EARTH PRESSURE; IMPACT; PUMPS AND PUMPING; WATER HAMMER; WATER PRESSURE; WAVES

PRESSURE GAGES
See GAGES, PRESSURE

PRESSURE TUNNELS
See TUNNELS, WATER

PRINCIPLE OF LEAST WORK
See STRUCTURES, THEORY OF

PRINCIPLE OF SUPERPOSITION
See STRUCTURES, THEORY OF

PRINCIPLE OF VIRTUAL WORK
See VIRTUAL WORK, PRINCIPLE OF

PROPERTY (landed property)
See INSURANCE; VALUATION

PROTECTIVE COATINGS
See CORROSION AND PROTECTION OF METALS

PROTOTYPES AND MODELS
See MODELS

PUBLIC HEALTH
See WATER SUPPLY

PUBLIC UTILITIES
See also POWER; POWER PLANTS; WATER POWER
United States electric utility system capacity and production, years 1920–2000, by decades, 284.

PUBLIC WORKS
See under type of structure or project

PUMPS AND PUMPING
"Generating Station on the Niagara River," Frank Dobson, 32.
"Predicting Surge Pressures in Oil Pipelines," Robert D. Kersten and Edwin J. Waller (with discussion), 258.

RADIOACTIVE TRACERS
Effluent dilutions studied by usage of radioactive tracers, 832.

RADIOACTIVE WASTE
See INDUSTRIAL WASTE

RADIOACTIVITY
"Design Features of the Dresden Nuclear Power Station," Joseph E. Love, Chester S. Darrow, and Burr H. Randolph, 617.

RECORDING APPARATUS
See under relative subject; *also* under general types of apparatus, e.g., DEFLECTION RECORDING APPARATUS; VIBRATION RECORDING APPARATUS

RECORDING INSTRUMENTS
See under relative subject; *also* under general types of instruments; e.g., WATER LEVEL RECORDING AND INDICATING INSTRUMENTS

RECREATIONAL FACILITIES
See RESERVOIRS

REDUNDANCE, STRUCTURAL
See STRUCTURES, THEORY OF

REINFORCED CONCRETE
See CONCRETE...

RESEARCH
See also LABORATORIES (cross references thereunder); *see also* under relative subject, e.g., HIGHWAYS AND ROADS—Research; WAVES
Hydraulic jump turbulence presented as a possible guide to needed future research, 927, 957, 964.

RESERVOIRS (General)
Work of Reservoir Control Center, Omaha, Nebraska, representing nine Missouri River states and seven federal agencies, 381, 389.

RESERVOIRS, FLOOD CONTROL
"Operation of Missouri River Main-Stem Reservoirs," Robert J. Pafford, Jr., 381.

RESERVOIRS, IRRIGATION
See also RESERVOIRS, WATER STORAGE
"Operation of Missouri River Main-Stem Reservoirs," Robert J. Pafford, Jr., 381.

RESERVOIRS, MULTI-PURPOSE
"Operation of Missouri River Main-Stem Reservoirs," Robert J. Pafford, Jr., 381.

RESERVOIRS, WATER STORAGE
"Salt Balance in Ground-Water Reservoirs," David B. Willets and Charles A. McCullough, 224. *Discussion:* Robert O. Thomas; and David B. Willets and Charles A. McCullough, 232.

RIGHT OF WAY (vehicle passage)
See TRAFFIC...
RIGID FRAMES
See STRESS AND STRAIN—Frames, Rigid
RIVER BANKS AND BANK PROTECTION
See FLOODS; LEVEES
RIVER BASINS
See DRAINAGE; RESERVOIRS ...; RUNOFF; VALLEYS
RIVER DELTAS
"Engineering Geology of the Mississippi Valley," Charles R. Kolb and Woodland G. Shockley (with discussion), 633.
RIVER MEANDERING
See RIVERS
RIVER REGULATION
See FLOOD ROUTING; WATER, FLOW OF, IN OPEN CHANNELS
RIVERS (General)
See also BRIDGES...; DRAINAGE; FLOOD ROUTING; FLOODS; LEVEES; RESERVOIRS...; RUNOFF; VALLEYS; WATER...; WAVES
RIVERS (Geographical)
Kings River
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.
Mississippi River
Meander belt deposits and their geological importance, 636, 646, 647, 648, 649, 651.
Missouri River
"Operation of Missouri River Main-Stem Reservoirs," Robert J. Pafford, Jr., 381.
Niagara River
"Generating Station on the Niagara River," Frank Dobson, 32.
"Model Studies of Remedial Works for Niagara Falls," Andrew P. Rollins, Jr. and George B. Fenwick, 236.
RIVER VALLEYS
See VALLEYS
ROADS
See HIGHWAYS AND ROADS
ROCK
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.
ROCK-FILL DAMS
See DAMS, ROCK-FILL
RODS, TIE
See STRESS AND STRAIN—Tie Rods
ROLLED-FILL DAMS
See DAMS, EARTH
ROLLERS, TAMPING
See SOILS—Compaction (cross reference thereunder)
ROUGHNESS
See FRICTION
ROUGHNESS FACTOR
See FRICTION COEFFICIENTS...
ROUTING, FLOOD
See FLOOD ROUTING
RUNOFF (Geographical)
Missouri River Basin
Annual runoff above Sioux City, Iowa during 1898–1956 record period, 385.
SALT
Californian salt balance in ground water reservoirs, and salt balance problems, 224.
Salt sources, 225.
SAMPLING
See under relative subject, e.g., FLOODS
SAND
See also SEEPAGE; SILT AND SILTING
"Engineering Geology of the Mississippi Valley," Charles R. Kolb and Woodland G. Shockley (with discussion), 633.
SAND BARS
See BARS (alluvia)
SAND DRAINS
See WELLS
SAND TRAPS
See WATER, FLOW OF, IN OPEN CHANNELS
SANITATION
See SEWAGE DISPOSAL; SEWERS
SCIENTIFIC SOCIETIES
See AMERICAN SOCIETY OF CIVIL ENGINEERS
SCOUR
See EROSION, BEACH
SEA...
See also MARINE; OCEAN...; WATER...; WAVES

SEACOAST
See SHORES AND SHORE PROTECTION; WAVES
SEASHORE
See SHORES AND SHORE PROTECTION
SEATRAINS
See SHIPS AND SHIPPING (cross reference thereunder)
SEA WATER
"Sewage Disposal in Santa Monica Bay," Charles G. Gunnerson (with discussion), 823.
SEAWAYS
See WATERWAYS (cross references thereunder)
SEDIMENT AND SEDIMENTATION
See SILT AND SILTING
SEEPAGE
"Compacting Earth Dams with Heavy Tamping Rollers," Jack W. Hilf (with discussion), 409.
"Review of the Theories for Sand Drains," F. E. Richart, Jr. (with discussion), 709.
"Wave Run-Up on Roughened and Permeable Slopes," Rudolph P. Savage, 852.
SEWAGE DISPOSAL (Geographical)
Los Angeles, Calif.
"Sewage Disposal in Santa Monica Bay," Charles G. Gunnerson (with discussion), 823.
Santa Monica Bay, Calif.
"Sewage Disposal in Santa Monica Bay," Charles G. Gunnerson, 823. *Discussion:* Charles H. Lawrance and David R. Miller; David I. H. Barr; and Charles G. Gunnerson, 843.
SEWAGE EFFLUENTS
See SEWAGE DISPOSAL
SEWAGE SLUDGE
See SEWAGE DISPOSAL
SEWAGE TREATMENT
See SEWAGE DISPOSAL
SEWAGE WORKS
See SEWAGE DISPOSAL
SEWERAGE
See SEWERS
SEWERS (General)
"Vortex Flow Through Horizontal Orifices," John C. Stevens and Richard C. Kolf (with discussion), 871.
"Water Supply Versus Irrigation in Humid Areas," Marion C. Boyer, 280.
SEWERS (Geographical)
Portland, Ore.
Flow diversions into interceptors from combined sewers, 879, 884, 888.
SHAFTS
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.
SHEAR
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
"Compacting Earth Dams with Heavy Tamping Rollers," Jack W. Hilf (with discussion), 409.
"Hydraulic Jump at an Abrupt Drop," Walter L. Moore and Carl W. Morgan (with discussion), 507.
"Ocean-Wave Forces on Circular Cylindrical Piles," Robert L. Wiegel, Kenneth E. Beebe, and James Moon (with discussion), 89.
"Prestressed Truss-Beams," Ralph L. Barnett, 472.
"Thixotropic Characteristics of Compacted Clays," H. Bolton Seed and Clarence K. Chan (with discussion), 894.
"Turbulence Characteristics of the Hydraulic Jump," Hunter Rouse, Tien To Siao and S. Nagaratnam (with discussion), 926.
SHEARING STRESS
See SHEAR
SHEEPSFOOT ROLLERS
See SOILS—Compaction (cross reference thereunder)
SHIP CANALS
See CANALS
SHIPS AND SHIPPING
See WATER TRANSPORTATION
SHOCK
See ATOMIC BLAST; BLASTING
SHORES AND SHORE PROTECTION (lands adjacent to lake, ocean or sea water)
See also BREAKWATERS; EROSION, BEACH; WAVES; *also* cross references under RIVER BANKS AND BANK PROTECTION

SHORES AND SHORE PROTECTION (*Continued*)
"Littoral-Drift Problem at Shore-Line Harbors," Joe W. Johnson, 525. *Discussion:* Richard Silvester; and Joe W. Johnson, 547.
"Wave Run-Up on Roughened and Permeable Slopes," Rudolph P. Savage, 852.

SILT AND SILTING (General)
"Littoral-Drift Problem at Shore-Line Harbors," Joe W. Johnson (with discussion), 525.
"Sewage Disposal in Santa Monica Bay," Charles G. Gunnerson (with discussion), 823.
Three main methods by which silt is moved alongshore, 547.

SLABS
"Tests to Evaluate Concrete Pavement Subbases," Lawrence D. Childs, Bert E. Colley, and Joe W. Kapernick, 556.

SLOPE PROTECTION
See WAVES

SLOPES, BEACH
See SHORES AND SHORE PROTECTION

SLUICES
"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.

SOCIETIES, TECHNICAL
See AMERICAN SOCIETY OF CIVIL ENGINEERS

SOIL...
See also EARTH...; GROUND...

SOIL MECHANICS
See SOILS

SOIL PRESSURE
See EARTH PRESSURE

SOILS (General)
See also STRESS AND STRAIN—Soils

Bibliography
Tamping roller usage for compressing various soil types, 434.

Classification
"Compacting Earth Dams with Heavy Tamping Rollers," Jack W. Hilf (with discussion), 409.
Mississippi River alluvial valley soils and their characteristics, 633, 643, 651.

Compaction. *See* BEARING CAPACITY

Tests and Testing. *See also* COSTS, SOIL TESTING
"Compacting Earth Dams with Heavy Tamping Rollers," Jack W. Hilf (with discussion), 409.
"Review of the Theories for Sand Drains," F. E. Richart, Jr. (with discussion), 709.
"Thixotropic Characteristics of Compacted Clays," H. Bolton Seed and Clarence K. Chan (with discussion), 894.

SOIL TRANSPORTATION
See SILT AND SILTING...

SOLITARY WAVES
See WAVES

SPEED
See TRAFFIC...; VELOCITY (cross reference thereunder)

SPILLWAYS (Geographical)

Vicksburg, Miss.
"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.

STATICALLY INDETERMINATE STRUCTURES
See STRUCTURES, TRUSSED (cross reference thereunder)

STATIONS
See under relative subject, e.g., POWER PLANTS; *see also* cross reference under TERMINALS

STATISTICS
See under relative subject; *see also* COMPUTATION AND COMPUTERS

STEAM TURBINES
See TURBINES, STEAM

STEEL (General)
See CORROSION AND PROTECTION OF METALS; FAILURES, STEEL; STRENGTH OF MATERIALS; *also* under special structure or structural part, e.g., ARCHES

STEEL PLATES
See PLATES (cross reference thereunder)

STIFFENING TRUSSES
See TRUSSES, STIFFENING

STIFFNESS
"Design of Flexible Steel Arches by Interaction Diagrams," Haaren A. Miklofsky and Omar J. Sotillo (with discussion), 1.

STILLING BASINS
See WATER, FLOW OF, IN OPEN CHANNELS

STORAGE
See RESERVOIRS...
STORMS
See WAVES; WIND
STORM WATER
See SEWERS
STRAIN
See STRESS AND STRAIN
STRAIN GAGES
See GAGES, STRAIN
STREAM CONTAMINATION
See WATER POLLUTION
STREAM FLOW
See WATER, FLOW OF, IN OPEN CHANNELS and cross references thereunder
STREAM GAGES
See GAGES, STREAM
STREAMS
See RIVERS and cross references thereunder
STREETS (General)
See also TRAFFIC, STREET
Planning and Design
"Adaptability of Interchanges to Interstate Highways," Jack E. Leisch (with discussion), 588.
STRENGTH OF MATERIALS
See also FAILURES...; STRESS AND STRAIN; *also* under specific material (*see* list under MATERIALS OF CONSTRUCTION); *also* under fabricated structure or structural part, e.g., BEAMS
"Inelastic Behavior of Impulsively Loaded Beams," Melvin J. Greaves and Frederic T. Mavis, 395.
STRESS AND STRAIN (General)
See also ELASTICITY; FAILURES; GAGES, STRAIN; MOMENTS; PLASTICITY; STIFFNESS; STRUCTURES, THEORY OF; VIBRATION; WAVES; WHEEL LOADS; WIND; *also* under specific type of stress, e.g., BUCKLING; SHEAR; TORSION
Arches
"Design of Flexible Steel Arches by Interaction Diagrams," Haaren A. Miklofsky and Omar J. Sotillo (with discussion), 1.
"Pressure Lines and Inelastic Buckling of Columns," Frank Baron and Harold S. Davis, 967.
Beams (General)
"Design of Flexible Steel Arches by Interaction Diagrams," Haaren A. Miklofsky and Omar J. Sotillo (with discussion), 1.
"Inelastic Behavior of Impulsively Loaded Beams," Melvin J. Greaves and Frederic T. Mavis, 395.
"Prestressed Truss-Beams," Ralph L. Barnett, 472.
Bridges, Girder
"Vibration of Simple-Span Highway Bridges," John M. Biggs, Herbert S. Suer and Jacobus M. Louw, 291.
Clay. *See* SHEAR
Columns
"Pressure Lines and Inelastic Buckling of Columns," Frank Baron and Harold S. Davis, 967.
Concrete (General)
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
"Tests to Evaluate Concrete Pavement Subbases," Lawrence D. Childs, Bert E. Colley, and Joe W. Kapernick, 556.
Flanges
"Plate Buckling in the Strain-Hardening Range," Geerhard Haaijer, 117.
"Prestressed Truss-Beams," Ralph L. Barnett, 472.
Foundations
"Tests to Evaluate Concrete Pavement Subbases," Lawrence D. Childs, Bert E. Colley, and Joe W. Kapernick, 556.
Frames, Continuous
Plate buckling in continuous frames based on ultimate strength design, 145.
Frames, Rigid
"Pressure Lines and Inelastic Buckling of Columns," Frank Baron and Harold S. Davis, 967.
Intakes
"Fixed-Wheel Gates for Penstock Intakes," Sylvan J. Skinner (with discussion), 740.
Pavement and Paving
"Tests to Evaluate Concrete Pavement Subbases," Lawrence D. Childs, Bert E. Colley, and Joe W. Kapernick, 556.

STRESS AND STRAIN (General) (*Continued*)

Piles

"Ocean-Wave Forces on Circular Cylindrical Piles," Robert L. Wiegel, Kenneth E. Beebe, and James Moon, 89. *Discussion:* Thomas E. Stelson; and Robert L. Wiegel, Kenneth E. Beebe, and James Moon, 114.

Plates

"Plate Buckling in the Strain-Hardening Range," Geerhard Haaijer, 117.

Reinforced Concrete. *See* Concrete (hereunder)

Soils

"Thixotropic Characteristics of Compacted Clays," H. Bolton Seed and Clarence K. Chan (with discussion), 894.

Structures (General)

"Pressure Lines and Inelastic Buckling of Columns," Frank Baron and Harold S. Davis, 967.

Trusses and Trussed Structures

"Prestressed Truss-Beams," Ralph L. Barnett, 472.

STRESS, SHEARING

See SHEAR

STRINGERS

See BEAMS

STRUCTURAL ANALYSIS

See EQUATIONS; STRESS AND STRAIN; STRUCTURES, THEORY OF

STRUCTURAL DYNAMICS

See also VIBRATION

"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.

"Inelastic Behavior of Impulsively Loaded Beams," Melvin J. Greaves and Frederic T. Mavis, 395.

STRUCTURAL MATERIALS

See MATERIALS OF CONSTRUCTION (cross references thereunder)

STRUCTURAL MEMBERS

See MEMBERS, STRUCTURAL (cross reference thereunder)

STRUCTURAL MODELS

See MODELS, STRUCTURAL

STRUCTURAL REDUNDANCE

See STRUCTURES, THEORY OF

STRUCTURES (General)

See also BUILDINGS; CONSTRUCTION (cross references thereunder); MATERIALS OF CONSTRUCTION (cross references thereunder); MODELS, STRUCTURAL; STRESS AND STRAIN; STRUCTURES, THEORY OF; VIBRATION; *see also* under specific type of structure, or related subject

"Engineering Geology of the Mississippi Valley," Charles R. Kolb and Woodland G. Shockley (with discussion), 633.

"Hurricane Design-Wave Practices," Charles L. Bretschneider, 39.

"Wave Run-Up on Roughened and Permeable Slopes," Rudolph P. Savage, 852.

STRUCTURES, HYDRAULIC

See HYDRAULIC STRUCTURES

STRUCTURES, THEORY OF

See also STRESS AND STRAIN; *also* under type of structure, or structural part

Beams and Girders (General)

"Design of Masonry Walls for Blast Loading," 457.

Linear theory to which principle of superposition is applied, 81.

Principle of least work and its extension into the nonlinear range, 70.

"Strength of Very Slender Beams," Ernest F. Masur, 63.

Beams and Girders, Continuous

"Analysis of Continuous Beams by Fourier Series," Seng-Lip Lee, 164. *Discussion:* Stefan J. Medwadowski, and Seng-Lip Lee, 175.

Bridges, Girder

"Vibration of Simple-Span Highway Bridges," John M. Biggs, Herbert S. Suer and Jacobus M. Louw, 291.

Walls

"Design of Masonry Walls for Blast Loading," Keith E. McKee and Eugene Sevin, 457.

STRUCTURES, TRUSSED

See TRUSSES...

STRUCTURES, UNDERGROUND

See UNDERGROUND STRUCTURES (cross reference thereunder)

SUBGRADES

See PAVEMENT AND PAVING, CONCRETE

SUPERPOSITION, PRINCIPLE OF

See STRUCTURES, THEORY OF

SURFACE PROFILES

See WATER SURFACE PROFILES (cross reference thereunder)

SURFACE RUNOFF
See RUNOFF
SURGES (water surface)
See WATER HAMMER; WAVES
SURGE TANKS
See TANKS, SURGE
SURVEYING
See SURVEYS AND SURVEYING
SURVEYS (research data)
See under relative subject, e.g., HIGHWAYS AND ROADS—Research; *see also* RESEARCH (cross references thereunder)
SURVEYS AND SURVEYING (General)
Electronic computer usage in teaching of surveying, and in surveying problems, 252, 255.
SUSPENDED LOAD
See SILT AND SILTING
TAIL WATER EROSION
See EROSION, TAIL WATER
TAMPING ROLLERS
See SOILS—Compaction (cross reference thereunder)
TANKS, SURGE
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.
TANKS, WATER
"Vortex Flow Through Horizontal Orifices," John C. Stevens and Richard C. Kolf (with discussion), 871.
TAXATION
See under relative subject, subheading Financing
TECHNICAL SOCIETIES
See AMERICAN SOCIETY OF CIVIL ENGINEERS
TENSILE STRESS
See STRESS AND STRAIN
TENSION
See STRESS AND STRAIN
TERMINALS (structures and localities)
See AIR TERMINALS (cross reference thereunder); WATER TERMINALS; *see also* cross references under STATIONS
TERMINOLOGY (Arranged hereunder by specific or comprehensive subject word when possible)

Beams. (Dynamic strength of a beam), 399.
Civil engineering defined, 632.
Clay sensitivity in soil terminology, 894.
Flood frequency. (Statistical method terms used), 368, 378.
Friction coefficient redefined, 342, 343.
Gas. (Critical temperature and critical pressure defined in relation to pure gas), 350.
Harbors. (Shore line harbor defined), 525, 526.
Highways and Roads. (Interchange terms), 589, 590.
Littoral drift. (Saltation in littoral drift process), 548, 554.
Load. (Critical load explained), 983.
Materials of construction. (Thixotropy as originally and later defined), 895, 917, 919, 920.
Pressure line defined and usage of concept extended, 967.
Rivers. (Natural levees, bar deposits, abandoned channels, and similar terms), 633.
Salt balance and effective salinity, simply defined and also amplified, 225, 228.
Sand drains. (Smear as used in relation to drain wells), 714.
Strength of materials. (Thixotropic strength ratio as a term), 903, 924.
Turbulence. (Intermittency as a term relating to fluid in transit), 956.
Water flow. (Eddy diffusion in sewage disposal), 826.
Wave run up defined, 852.
Waves. (Diffraction of ocean waves defined), 364.
Waves. (Solitary waves and incoming coastal surf wave differentiated), 193.
TESTS AND TESTING
See BUCKLING; ELASTICITY; FAILURES...; LABORATORIES... (cross references thereunder); MODELS...; SHEAR; STRESS AND STRAIN; STRUCTURES, THEORY OF; TORSION; WATER, FLOW OF...; *also* under material, structure or structural part tested, e.g., PAVEMENT AND PAVING, CONCRETE; PIPE LINES
THEORIES
See cross references hereunder and under ANALYSIS OF DATA; *see also* STRUCTURES, THEORY OF; *see also* under relative subject or its relative science, e.g., MATHEMATICS; WELLS

THEORY OF BOUNDARY LAYER (fluid flow)
See BOUNDARY LAYER, THEORY OF (cross reference thereunder)
THEORY OF PLASTICITY
See PLASTICITY
THEORY OF STRUCTURES
See STRUCTURES, THEORY OF
THEORY, PLASTIC
See PLASTICITY
THIXOTROPY
See CLAY
THRUST
See under relative structure, structural part or material, e.g., ARCHES
TIE RODS
See STRESS AND STRAIN—Tie Rods
TOLLS (General)
Toll system on the Welland Ship Canal, 453.
TORSION
"Strength of Very Slender Beams," Ernest F. Masur, 63.
TRACERS, RADIOACTIVE
See RADIOACTIVE TRACERS
TRAFFIC, BRIDGE
"Vibration of Simple-Span Highway Bridges," John M. Biggs, Herbert S. Suer and Jacobus M. Louw, 291.
TRAFFIC, CANAL
Tonnage passing through the Welland Ship Canals, 452.
TRAFFIC, HIGHWAY AND ROAD
"Adaptability of Interchanges to Interstate Highways," Jack E. Leisch (with discussion), 588.
"Highway Planning in the Past, Present, and Future," Edward H. Holmes and John T. Lynch, 149.
TRAFFIC, STREET
"Adaptability of Interchanges to Interstate Highways," Jack E. Leisch (with discussion), 588.
TRAILERSHIPS
See SHIPS AND SHIPPING (cross reference thereunder)
TRAINSHIPS
See SHIPS AND SHIPPING (cross reference thereunder)
TRANSFER BRIDGES
See BRIDGES, MOVABLE (TRANSFER)
TRANSLATORY WAVES
See WAVES
TRANSPORTATION
See also FREIGHT; HIGHWAY TRANSPORTATION; PIPE LINES; RIVERS; SOIL TRANSPORTATION (cross reference thereunder); TERMINALS (cross references thereunder); TRAFFIC ...; WATER TRANSPORTATION
Modes of ground transportation to and from large airports, 657.
TRAVELING CRANES
See CRANES, DERRICKS AND POWER SHOVELS
TRIGONOMETRY
See under relative subject
TRIAXIAL SHEAR
See SHEAR
TRUCKS
See MOTOR TRUCKS (cross reference thereunder)
TRUSSED STRUCTURES
See TRUSSES...
TRUSSES (General)
See also STRESS AND STRAIN—Trusses and Trussed Structures
Weight saving possibility of a variation of the Queen Port truss with a pretensioned tie rod, 472, 480.
TRUSSES, ARCH
"Design of Flexible Steel Arches by Interaction Diagrams," Haaren A. Miklofsky and Omar J. Sotillo (with discussion), 1.
TRUSSES, STIFFENING
"Design of Flexible Steel Arches by Interaction Diagrams," Haaren A. Miklofsky and Omar J. Sotillo (with discussion), 1.
TUNNELS, PRESSURE
See TUNNELS, WATER
TUNNELS, WATER
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.
TURBINES, STEAM
"Design Features of the Dresden Nuclear Power Station," Joseph E. Love, Chester S. Darrow, and Burr H. Randolph, 617.
TURBINES, WATER
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.

TURBULENCE (water agitation)
See also EDDIES (cross references thereunder); FRICTION...; WATER, FLOW OF...
"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.
"Flow Equations for Natural Gas Pipelines," Richard F. Bukacek (with discussion), 1027.
Recognition of three different regions of the turbulence spectrum, 965.
"Sewage Disposal in Santa Monica Bay," Charles G. Gunnerson (with discussion), 823.
"Turbulence Characteristics of the Hydraulic Jump," Hunter Rouse, Tien To Siao and S. Nagaratnam (with discussion), 926.

TURNPIKES
See HIGHWAYS AND ROADS

TWISTING
See TORSION; *see also* under relative material, structure or structural part, e.g., BEAMS

UNDERGROUND STRUCTURES
See under type of structure, e.g., POWER PLANTS

UNDERGROUND WATER
See GROUND WATER

UNDERWATER FOUNDATIONS
See FOUNDATIONS, UNDERWATER

UPLIFT, HYDROSTATIC
See WATER PRESSURE

URBAN...
See CITIES (cross references thereunder)

UTILITIES
See PUBLIC UTILITIES

VALLEYS (Geographical)
Mississippi River Valley
Alluvial valley of the lower Mississippi River, 209.
"Engineering Geology of the Mississippi Valley," Charles R. Kolb and Woodland G. Shockley (with discussion), 633.
"Evolution of Mississippi Valley Flood-Control Plan," John R. Hardin, 207.

VALUATION
See also COSTS...
"Technical Problems of Flood Insurance," H. Alden Foster (with discussion), 366.

VALVES
"Haas Hydroelectric Power Project," J. Barry Cooke (with discussion), 989.

VEHICLES
See under general types of vehicles, e.g., MOTOR VEHICLES; *also* under specific type of vehicle, e.g., AUTOMOBILE...

VEHICLE SHIPS
See SHIPS AND SHIPPING (cross reference thereunder)

VEHICULAR TRAFFIC
See TRAFFIC...

VELOCITY
See VIBRATION; WATER, FLOW OF...; WIND

VELOCITY DISTRIBUTION
See WATER, FLOW OF...

VENTURI FLUMES
See FLUMES

VIBRATION
"Behavior of Reinforced Concrete Shear Walls," Jack R. Benjamin and Harry A. Williams (with discussion), 669.
"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.
"Ocean-Wave Forces on Circular Cylindrical Piles," Robert L. Wiegel, Kenneth E. Beebe, and James Moon (with discussion), 89.
"Vibration of Simple-Span Highway Bridges," John M. Biggs, Herbert S. Suer and Jacobus M. Louw, 291.

VIBRATION RECORDING APPARATUS
"Ocean-Wave Forces on Circular Cylindrical Piles," Robert L. Wiegel, Kenneth E. Beebe, and James Moon (with discussion), 89.
Two lane girder bridge model test apparatus, 295.

VIRTUAL WORK, PRINCIPLE OF
Usage of principle in design procedure for prestressed truss beams, 478.

VISCOSITY
"Attenuation of Solitary Waves on a Smooth Bed," Yoshiaki Iwasa, 193.
"Discharge Characteristics of Rectangular Thin-Plate Weirs," Carl E. Kindsvater and Rolland W. Carter (with discussion), 772.

VISCOSITY (*Continued*)
"Flow of Natural Gas in Pipelines," William T. Ivey and James H. Dorough, 341.
"Turbulence Characteristics of the Hydraulic Jump," Hunter Rouse, Tien To Siao and S. Nagaratnam (with discussion), 926.

VOID RATIO
See SOILS

VORTEXES
See VORTICES (cross reference thereunder)

VORTEX FLOW
See WATER, FLOW OF, THROUGH ORIFICES

VORTICES
See EDDIES (cross references thereunder)

WALLS
See under relative structure or type of wall, e.g., BUILDINGS; *see also* STRUCTURES, THEORY OF—Walls

WASTE DISPOSAL
See SEWERS

WATER...
See also COSTS...; DRAINAGE; DROP-DOWN; EROSION...; FLOODS; FLUMES; GROUND WATER; HYDRAULIC... (cross references thereunder); HYDRO-...; IRRIGATION; MODELS, HYDRAULIC; OCEAN (cross references thereunder); PIPE LINES; RESERVOIRS; RUNOFF; SEWERS; TERMINOLOGY; TURBULENCE; WAVES

WATER, CONSUMPTION OF (consumer usage)
"Water Supply Versus Irrigation in Humid Areas," Marion C. Boyer, 280.

WATER DIVERSION
See also FLOOD ROUTING
"Model Studies of Remedial Works for Niagara Falls," Andrew P. Rollins, Jr. and George B. Fenwick, 236.
"Vortex Flow Through Horizontal Orifices," John C. Stevens and Richard C. Kolf (with discussion), 871.

WATER, FLOW OF (General)
See also TURBULENCE; VISCOSITY
Head losses due to resistance to flow in drain wells, 721.
"Review of the Theories for Sand Drains," F. E. Richart, Jr. (with discussion), 709.

WATER, FLOW OF, IN OPEN CHANNELS
See also DROP-DOWN; FLOODS; RUNOFF; WAVES
Abrupt separation of boundary layer under the beginning of the hydraulic jump and its cause, 951, 955.
"Attenuation of Solitary Waves on a Smooth Bed," Yoshiaki Iwasa, 193.
"Discharge Characteristics of Rectangular Thin-Plate Weirs," Carl E. Kindsvater and Rolland W. Carter (with discussion), 772.
Eddy motion violence in upper levels of downstream channel flow, 512.
"Errors in Measurement of Irrigation Water," Charles W. Thomas, 319. *Discussion:* Odon Starosolszky; Steponas Kolupaila; Armando Balloffet; and Charles W. Thomas, 333.
"Fixed-Wheel Gates for Penstock Intakes," Sylvan J. Skinner (with discussion), 740.
"Hydraulic Jump at an Abrupt Drop," Walter L. Moore and Carl W. Morgan (with discussion), 507.
Sand trap type used at Haas Power Project on Kings River, California, 999, 1026.
Submerged weir usage in water diversion on the Niagara River, 236, 251.
"Turbulence Characteristics of the Hydraulic Jump," Hunter Rouse, Tien To Siao and S. Nagaratnam (with discussion), 926.

WATER, FLOW OF, IN PIPES
See PIPE LINES; PUMPS AND PUMPING; SEWERS

WATER, FLOW OF, OVER DAMS AND WEIRS
Complete mathematical analysis of flow patterns for rectangular weirs versus dimensional analysis and experiment, 773, 808, 814, 820.
"Discharge Characteristics of Rectangular Thin-Plate Weirs," Carl E. Kindsvater and Rolland W. Carter, 772. *Discussion:* Turgut Sarpkaya; Steponas Kolupaila; Ralph W. Powell; John W. Paull; Iwao Oki; Marion R. Carstens; and Carl E. Kindsvater and Rolland W. Carter, 802.

WATER, FLOW OF, OVER DAMS AND WEIRS (*Continued*)

Exceptional range of geometric conditions existing in the analysis of flow over rectangular thin plate weirs, 817, 819, 820, 821.

Extensive tests of full width weirs, years 1911–1920, 780.

"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.

WATER, FLOW OF, THROUGH ORIFICES

"Vortex Flow Through Horizontal Orifices," John C. Stevens and Richard C. Kolf, 871. *Discussion:* John W. Cunningham; Chesley J. Posey; and John C. Stevens and Richard C. Kolf, 884.

WATER GATES, MOVABLE

"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.

WATER, GROUND

See GROUND WATER

WATER HAMMER

"Predicting Surge Pressures in Oil Pipelines," Robert D. Kersten and Edwin J. Waller, 258. *Discussion:* Henry M. Paynter; and Robert D. Kersten and Edwin J. Waller, 273.

WATER INSTRUMENTS

See under types of instruments, e.g., GAGES...

WATER LEVEL RECORDING AND INDICATING INSTRUMENTS

"Errors in Measurement of Irrigation Water," Charles W. Thomas (with discussion), 319.

WATER POLLUTION

Sewage pollution

Fish life off the California coast, 828, 829, 834, 842.

WATER POWER (Geographical)

Niagara River

"Model Studies of Remedial Works for Niagara Falls," Andrew P. Rollins, Jr. and George B. Fenwick, 236.

WATER PRESSURE

"Field Investigations of Spillways and Outlet Works," Benson Guyton, 491.

"Fixed-Wheel Gates for Penstock Intakes," Sylvan J. Skinner (with discussion), 740.

"Hydraulic Jump at an Abrupt Drop," Walter L. Moore and Carl W. Morgan (with discussion), 507.

"Review of the Theories for Sand Drains," F. E. Richart, Jr. (with discussion), 709.

USBR pore water pressure theory tested, 431.

WATER, SEA

See SEA WATER

WATERSHEDS

See DRAINAGE; RUNOFF

WATER STORAGE

See RESERVOIRS...

WATER, STORM

See SEWERS

WATER SUPPLY (General)

See also COSTS, WATER SUPPLY; FLOOD...; GAGES...; GROUND WATER; IRRIGATION; RESERVOIRS...; WATER... (related subject headings thereunder)

Irrigation water quality classified, 228.

"Water Supply Versus Irrigation in Humid Areas," Marion C. Boyer, 280.

WATER SUPPLY (Geographical)

California

"Salt Balance in Ground-Water Reservoirs," David B. Willets and Charles A. McCullough (with discussion), 224.

Indianapolis, Ind.

Water requirements, with statistics, for Indianapolis and vicinity, 288, 290.

WATER SURFACE PROFILES

See WATER, FLOW OF, THROUGH ORIFICES

WATER SURFACE SURGES

See WAVES

WATER TANKS

See TANKS, WATER

WATER TERMINALS (structures and localities)

"Characteristics of New-Type Cargo Ships," Douglas C. MacMillan, 179.

WATER TRANSPORTATION

See also FREIGHT; RIVERS; WATER TERMINALS

Cargo ship types and their characteristics tabulated, 183.

"Characteristics of New-Type Cargo Ships," Douglas C. MacMillan, 179.

WATER TUNNELS

See TUNNELS, WATER

WATER TURBINES
See TURBINES, WATER
WATER WAVES
See WAVES
WATERWAYS (General)
See CANALS; CHANNELS (cross references thereunder); FREIGHT; OCEAN... (cross references thereunder); RIVERS; SEA... (cross references thereunder); WATER DIVERSION; WATER TRANSPORTATION
WAVES
See also CURVES, WAVE RUN UP; SHORES AND SHORE PROTECTION; WATER PRESSURE
Apparatus for wave run up tests, 853.
"Attenuation of Solitary Waves on a Smooth Bed," Yoshiaki Iwasa, 193.
"Hurricane Design-Wave Practices," Charles L. Bretschneider, 39.
Linear wave theory disadvantages, 109, 112.
Maximum expected ocean wave steepness for various periods and depths of water, 358.
"Ocean-Wave Forces on Circular Cylindrical Piles," Robert L. Wiegel, Kenneth E. Beebe, and James Moon (with discussion), 89.
"Offshore Breakwaters," Richard Silvester, 356.
Shallow water wind wave forecasting techniques and computing procedures, 55, 61.
"Wave Run-Up on Roughened and Permeable Slopes," Rudolph P. Savage, 852.
WEATHER
See FLOODS; WIND
WEB BUCKLING
See BUCKLING
WEBS
See BEAMS
WEIRS (General)
See WATER, FLOW OF, IN OPEN CHANNELS; WATER, FLOW OF, OVER DAMS AND WEIRS
WELLS
"Review of the Theories for Sand Drains," F. E. Richart, Jr., 709. *Discussion:* Yoshichika Nishida; S. J. Johnson; and F. E. Richart, Jr., 737.
WHEEL GATES, FIXED
See INTAKE GATES (cross reference thereunder)
WHEEL LOADS
"Vibration of Simple-Span Highway Bridges," John M. Biggs, Herbert S. Suer and Jacobus M. Louw, 291.
WHIRLPOOLS
See EDDIES (cross references thereunder)
WILDLIFE
See under relative technical subject, e.g., RESERVOIRS
WIND (General)
"Hurricane Design-Wave Practices," Charles L. Bretschneider, 39.
Tide and wave "energy indexes" as used in classifying hurricanes and their frequency, 48, 60.
WORKS (industrial buildings and equipment)
See under specific type of works, e.g., GAS AND GASWORKS; SEWAGE WORKS (cross reference thereunder)

AUTHOR INDEX

(including Memoirs of deceased members)

ALEXANDER, GEOFFREY N.
Flood insurance, 376.

ANDREWS, ROBERT EDMUND
Memoir of, 1053.

BALLOFFET, ARMANDO
Irrigation water measurement errors, 336.

BARBER, EDWARD S.
Compacted clays, 917.

BARNETT, RALPH L.
"Prestressed Truss-Beams," 472.

BARON, FRANK
"Pressure Lines and Inelastic Buckling of Columns," 967.

BARR, DAVID I. H.
Sewage disposal, 850.

BASSEL, GUY MANNERING
Memoir of, 1054.

BEEBE, KENNETH E.
"Ocean-Wave Forces on Circular Cylindrical Piles," 89.

BENJAMIN, JACK R.
"Behavior of Reinforced Concrete Shear Walls," 669.

BIGGS, JOHN M.
"Vibration of Simple-Span Highway Bridges," 291.

BOWMAN, JOSEPH R.
Gates, 769.

BOYER, MARION C.
"Water Supply Versus Irrigation in Humid Areas," 280.

BRADLEY, JOSEPH N.
Hydraulic jump, 952.

BRETSCHNEIDER, CHARLES L.
"Hurricane Design-Wave Practices," 39.

BROWN, ULYSSES GRANT
Memoir of, 1054.

BUKACEK, RICHARD F.
"Flow Equations for Natural Gas Pipelines," 1027.

CARSTENS, MARION R.
Thin plate weirs, 816.

CARTER, ROLLAND W.
"Discharge Characteristics of Rectangular Thin-Plate Weirs," 772.

CHAN, CLARENCE K.
"Thixotropic Characteristics of Compacted Clays," 894.

CHASE, LEON EVERETT
Memoir of, 1055.

CHILDS, LAURENCE D.
"Tests to Evaluate Concrete Pavement Subbases," 556.

COLLEY, BERT E.
"Tests to Evaluate Concrete Pavement Subbases," 556.

COLLIER, BEN TAYLOR
Memoir of, 1056.

COOKE, J. BARRY
"Haas Hydroelectric Power Project," 989.

CUNNINGHAM, JOHN W.
Vortex flow, 884.

DARROW, CHESTER S.
"Design Features of the Dresden Nuclear Power Station," 617.

DAVIS, HAROLD S.
"Pressure Lines and Inelastic Buckling of Columns," 967.

DOBSON, FRANK
"Generating Station on the Niagara River," 32.

DOROUGH, JAMES H.
Flow equations, 1035.
"Flow of Natural Gas in Pipelines," 341.

EAST, ERNEST ELWOOD
Memoir of, 1057.

ECKART, NELSON ANDREW
Memoir of, 1057.

FARGO, WILLIAM GILBERT
Memoir of, 1058.

FAYLOR, JOHN DAYTON
Memoir of, 1059.

FENWICK, GEORGE B.
"Model Studies of Remedial Works for Niagara Falls," 236.

FORSTER, JOHN W.
Hydraulic jump, 519.
FOSTER, H. ALDEN
"Technical Problems of Flood Insurance," 366.
FRIEL, FRANCIS S.
"Current Challenges in Civil Engineering": Annual Address at the Convention, Cleveland, Ohio, May 5, 1959, 1038.
GARCIA-ITURBE, REINALDO
Interaction diagrams, 30.
GREAVES, MELVIN J.
"Inelastic Behavior of Impulsively Loaded Beams," 395.
GRIME, EDWIN MORRELL
Memoir of, 1059.
GUNNERSON, CHARLES G.
"Sewage Disposal in Santa Monica Bay," 823.
GUYTON, BENSON
"Field Investigations of Spillways and Outlet Works," 491.
HAAIJER, GEERHARD
"Plate Buckling in the Strain-Hardening Range," 117.
HAINES, EUGENE GROVE
Memoir of, 1060.
HARDIN, JOHN R.
"Evolution of Mississippi Valley Flood-Control Plan," 207.
HARLEMAN, DONALD R. F.
Hydraulic jump, 959.
HAUG, THADDEUS LEON EUCLID
Memoir of, 1061.
HEISELMAN, CHRISTOPHER FRANK
Memoir of, 1062.
HEMMINGS, HARRY
Memoir of, 1062.
HILF, JACK W.
"Compacting Earth Dams with Heavy Tamping Rollers," 409.
HILL, CHARLES STEPHEN
Memoir of, 1063.
HODGSON, JACK D.
Tamping rollers, 436.
HOLMES, EDWARD H.
"Highway Planning in the Past, Present, and Future," 149.
HORNER, WESLEY WINANS
Memoir of, 1049.
HOWIE, HOWARD
Memoir of, 1064.
HUBBARD, PHILIP G.
Hydraulic jump, 962.
IVEY, WILLIAM T.
Flow equations, 1036.
"Flow of Natural Gas in Pipelines," 341.
IWASA, YOSHIAKI
"Attenuation of Solitary Waves on a Smooth Bed," 193.
JENSEN, CHARLES
Memoir of, 1065.
JOHNSON, JOE W.
"Littoral-Drift Problems at Shore-Line Harbors," 525.
JOHNSON, S. J.
Sand drains, 737.
JORISSEN, ANDRE LAURENT
Memoir of, 1065.
KAPERNICK, JOE W.
"Tests to Evaluate Concrete Pavement Subbases," 556.
KERSTEN, ROBERT D.
"Predicting Surge Pressures in Oil Pipelines," 258.
KIDDER, ARTHUR DALE
Memoir of, 1066.
KILLALEE, JACK ADELBERT
Memoir of, 1067.
KINDSVATER, CARL E.
"Discharge Characteristics of Rectangular Thin-Plate Weirs," 772.
KLEIN, FREDERICK LAURENCE
Memoir of, 1067.
KOLB, CHARLES R.
"Engineering Geology of the Mississippi Valley," 633.
KOLF, RICHARD C.
"Vortex Flow Through Horizontal Orifices," 871.
KOLUPAILA, STEPONAS
Flood insurance, 379.
Irrigation water measurement errors, 336.
Thin plate weirs, 808.
KRAMER, HANS
Memoir of, 1068.
KRYNINE, D. P.
Compacted clays, 917.
LAWRANCE, CHARLES H.
Sewage disposal, 843.

LAWTON, F. L.
Haas hydroelectric power project, 1024.
LEE, SENG-LIP
"Analysis of Continuous Beams by Fourier Series," 164.
LEFEVER, KENNETH WINANS
Memoir of, 1069.
LEISCH, JACK E.
"Adaptability of Interchanges to Interstate Highways," 588.
LI, C. Y.
Tamping rollers, 438.
LI, SHU-T'IEN
Geology, 646.
LOUW, JACOBUS M.
"Vibration of Simple-Span Highway Bridges," 291.
LOVE, ANDREW CAVITT
Memoir of, 1070.
LOVE, GERALD D.
Highway interchanges, 614.
LOVE, JOSEPH E.
"Design Features of the Dresden Nuclear Power Station," 617.
LYNCH, JOHN T.
"Highway Planning in the Past, Present, and Future," 149.
MacMILLAN, DOUGLAS C.
"Characteristics of New-Type Cargo Ships," 179.
MASHBURN, LEON WADDELL
Memoir of, 1071.
MASUR, ERNEST F.
"Strength of Very Slender Beams," 63.
MATTESON, DeFOREST A., JR.
Shear walls, 703.
MATTHES, GERARD HENDRIK
Memoir of, 1050.
MAVIS, FREDERIC T.
"Inelastic Behavior of Impulsively Loaded Beams," 395.
McCULLOUGH, CHARLES A.
"Salt Balance in Ground-Water Reservoirs," 224.
McENTEER, FRANK DUFF
Memoir of, 1071.
McKEE, KEITH E.
"Design of Masonry Walls for Blast Loading," 457.
McNAIR, ARTHUR J.
"Electronic Computers in Surveying," 252.
McPHERSON, MURRAY B.
Hydraulic jump, 517.
MEDWADOWSKI, STEFAN J.
Continuous beams, 175.
MIKLOFSKY, HAAREN A.
"Design of Flexible Steel Arches by Interaction Diagrams," 1.
MILLER, DAVID R.
Sewage disposal, 843.
MOON, JAMES
"Ocean-Wave Forces on Circular Cylindrical Piles," 89.
MOORE, WALTER L.
"Hydraulic Jump at an Abrupt Drop," 507.
MORGAN, CARL W.
"Hydraulic Jump at an Abrupt Drop," 507.
MUNSON, THURMOND ARMOUR
Memoir of, 1072.
NAGARATNAM, S.
"Turbulence Characteristics of the Hydraulic Jump," 926.
NILES, CHARLES FERNALD
Memoir of, 1073.
NISHIDA, YOSHICHIKA
Sand drains, 737.
OKI, IWAO
Thin plate weirs, 814.
O'NEIL, WILLIAM A.
"The Welland Canal," 443.
PAFFORD, ROBERT J., JR.
"Operation of Missouri River Main-Stem Reservoirs," 381.
PARKER, ROBERT PRESTON
Memoir of, 1073.
PATON, JAMES LINDSAY
Memoir of, 1074.
PAULL, JOHN W.
Thin plate weirs, 814.
PAYNTER, HENRY M.
Surge pressures, 273.
PETERKA, ALVIN J.
Hydraulic jump, 952.
POSEY, CHESLEY J.
Vortex flow, 885.
POWELL, RALPH W.
Thin plate weirs, 809.
RANDOLPH, BURR H.
"Design Features of the Dresden Nuclear Power Station," 617.

RATHBUN, JOHN CHARLES
Memoir of, 1075.
RICHART, F. E., JR.
"Review of the Theories for Sand Drains," 709.
ROBERTSON, JAMES M.
Hydraulic jump, 954.
ROLLINS, ANDREW P., JR.
"Model Studies of Remedial Works for Niagara Falls," 236.
ROUSE, HUNTER
"Turbulence Characteristics of the Hydraulic Jump," 926.
SADAR, DONALD JOSEPH
Memoir of, 1076.
SAMUEL, THOMAS DUNCAN, JR.
Memoir of, 1076.
SARPKAYA, TURGUT
Thin plate weirs, 802.
SAVAGE, RUDOLPH P.
"Wave Run-Up on Roughened and Permeable Slopes," 852.
SCHOMAKER, JOHN F.
Flow equations, 1037.
SEED, H. BOLTON
"Thixotropic Characteristics of Compacted Clays," 894.
SEVIN, EUGENE
"Design of Masonry Walls for Blast Loading," 457.
SHOCKLEY, WOODLAND G.
"Engineering Geology of the Mississippi Valley," 633.
SHOEMAKER, ROBERT RADCLIFFE
Memoir of, 1077.
SIAO, TIEN TO
"Turbulence Characteristics of the Hydraulic Jump," 926.
SILBERMAN, EDWARD
Hydraulic jump, 951.
SILVESTER, RICHARD
Littoral drift, 547.
"Offshore Breakwaters," 356.
SKINNER, SYLVAN J.
"Fixed-Wheel Gates for Penstock Intakes," 740.
SOTILLO, OMAR J.
"Design of Flexible Steel Arches by Interaction Diagrams," 1.
SPRY, FREDERICK JOSIAH
Memoir of, 1078.
STAROSOLSZKY, ODON
Irrigation water measurement errors, 333.
STELSON, THOMAS E.
Wave forces, 114.
STEVENS, JOHN C.
"Vortex Flow Through Horizontal Orifices," 871.
STRICKLAND, RICHARD I.
"Ground Transportation at New York International Airport," 657.
STRICKLER, THOMAS JOHNSON
Memoir of, 1078.
SUER, HERBERT S.
"Vibration of Simple-Span Highway Bridges," 291.
THOMAS, CHARLES W.
"Errors in Measurement of Irrigation Water," 319.
THOMAS, ROBERT O.
Salt balance, 232.
TIPTON, RICHARD RANDOLPH
Memoir of, 1079.
WALKER, HARRY BRUCE
Memoir of, 1080.
WALLER, EDWIN J.
"Predicting Surge Pressures in Oil Pipelines," 258.
WIEGEL, ROBERT L.
"Ocean-Wave Forces on Circular Cylindrical Piles," 89.
WILLETS, DAVID B.
"Salt Balance in Ground-Water Reservoirs," 224.
WILLIAMS, HARRY A.
"Behavior of Reinforced Concrete Shear Walls," 669.
WILSON, WILBUR M.
Memoir of, 1051.
WOODS, ROBERT PATTERSON
Memoir of, 1081.
YOUNGCLAUS, GEORGE DUNTON
Memoir of, 1081.